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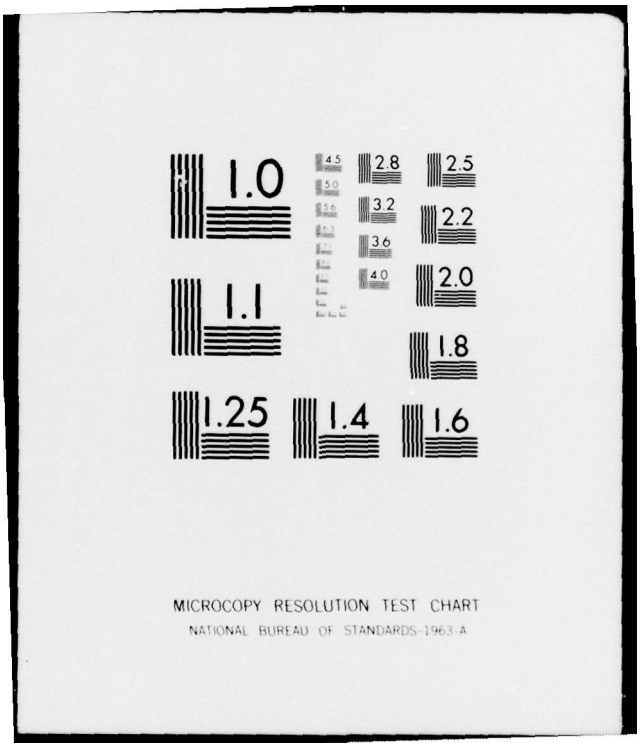
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COMPUTER APPLICATIONS IN NAVY PSYCHIATRY

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REPORT NO. 72-15

NAVAL HEALTH RESEARCH CENTER

SAN DIEGO, CALIFORNIA 92152

NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND

BETHESDA, MARYLAND

Computer Applications in Navy Psychiatry°

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Computer-based information storage and retrieval is a recent development in medicine and psychiatry. Computer techniques promise to enormously facilitate large-scale research on epidemiology, etiology, prognosis, and treatment outcomes in the psychiatric disorders. Gunderson[5] has previously noted the potential contributions of computer technology to the management of large psychiatric service programs in military organizations. Of particular importance is the development of longitudinal files which include post-hospital follow-up for all cases in order to survey the mental health problems of the whole population and to conduct systematic research on clinical decisions, prognosis, and treatment effectiveness. Such a system has been devised for members of the naval service.

Ulett and Sletten[10] and Hedlund[6] have described comprehensive computer-based systems which construct and manipulate hospital record files for rapid access. Glueck[4] and Pearson[8] also developed computer systems for storage and manipulation of clinical data, including behavior rating scales, nursing notes, and MMPI scores. These systems do not provide outcome information.

Follow-up data on post-hospital outcomes are believed to affect psychiatric theory and practice in three ways: (1) baseline information on psychiatric illnesses and their outcomes with minimal information loss is essential for evaluating current programs and planning future mental health programs, (2) feedback may increase treatment effectiveness by motivating therapists to do well, raising treatment expectations and increasing treatment efforts, and (3) feedback provides information so that effective components of treatment processes can be identified and evaluated.

This report will describe the Navy computer-based psychiatric record system previously referred to by Gunderson[5]. The computer files contain demographic, military status, clinical, disposition, and post-hospital outcome information on each person admitted to an inpatient psychiatric facility in the naval medical system.

The Navy-Wide Psychiatric Inpatient File

The central feature of this information system is a fixed length inpatient file consisting of three basic records.

(1) Individual Statistical Data Card. This record contains 40 fields and is prepared for each patient at the time of discharge from a psychiatric facility. The following items of information are included: (a) patient identification numbers, (b) demographic information, including age, sex, race, and marital status, (c) reporting facility (hospital), (d) military status, (e) date of admission to a medical facility, (f) primary and secondary psychiatric diagnoses, (g) date of discharge from the hospital, and (h) military career information, including duty station, occupational specialty, length of service, and pay grade (rank).

(2) Medical Board Card. Patients who are given medical dispositions from the hospital (as opposed to those service members who are dealt with administratively) receive evaluations by Medical Boards; these records contain the following information: (a) patient identification numbers, (b) demographic information, (c) reporting facility, (d) service history, and (e) a synopsis of the patient's clinical history, including dates of illness, dates of board transactions, diagnoses, origin of illness, present condition, prognosis and recommended disposition.

(3) Physical Evaluation Board Card. Patients who are referred to a physical evaluation board for judgments of disability and compensation have record cards which contain the following information: (a) patient identification numbers, (b) a brief history of medical transactions in the service, (c) origin of the illness, (d) disability rating (in percent), (e) patient demographic information, (f) patient service category and pay grade, (g) diagnoses, and (h) physical evaluation board recommended action.

(4) Changes in the Navy Enlisted Master Tape. In addition to the three patient transaction records, information is gathered concerning service career history. Any changes in an enlisted patient's service status are reported to the Bureau of Naval Personnel and that service member's history file is up-dated. Computer tapes containing these changes in status include the following information: (a) member identification, including name and Social Security Number, (b) present occupational specialty, (c) duty station assignment, (d) educational level and aptitude scores, (e) demographic information, including birth date, birth place, marital status, sex, and race, (f) a brief service history, including technical training, losses of time or money, pay grade (rank), length of service, awards received and disciplinary

actions, (g) home mailing address, (h) discharge information, indicating whether the serviceman successfully completed his military service or was prematurely discharged, and (i) any Vietnam service.

Computer File Maintenance

Whenever a patient is discharged from a psychiatric service, patient record cards (IBM cards) are sent to one of four Navy Medical Regional Data Centers. These Centers forward the records to the Bureau of Medicine and Surgery Data Service Center, Bethesda, Maryland, for edit and correction. On a regular basis, the Data Services Center sends Navy and Marine Corps psychiatric record cards to the Navy Medical Neuropsychiatric Research Unit (NMPRU), San Diego, California. The data are loaded on magnetic tape for editing and filing instructions.

Similarly, NMPRU San Diego receives copies of changes that have occurred in patients' service status from the Master Enlisted Tape Record Changes. As new cards are entered on the magnetic tape files, a number of procedures are carried out automatically to prepare the record for research analysis. All records received are sorted by reporting facility and patient identification number (register number) for convenient manipulation and editing. Further sorts can be made to produce research files according to any format the investigator might wish to impose upon the data. Internal checks are made of the data fields to assure (1) that all data are within the ranges set for each field, and (2) that the data have internal consistency, e.g., hospital admission dates are earlier than discharge dates. Many errors and inconsistencies can be easily corrected based upon past experience and total information in the record. Error listings can be sent to the Bureau of Medicine and Surgery Data Services Center when additional corrections are needed.

Additional variables or information items can be derived from existing information, e.g., length of hospitalization (days) can be computed from admission and discharge dates, or broad diagnostic categories (Psychoses, Neuroses, etc.) can be derived by grouping several related specific diagnoses. Any part of the records can be extracted and rewritten from the total record. Records may be searched, counts made, and records summarized, e.g., Individual Statistical Data Cards may be read and a summary of the number of transfers from one hospital to another may be written. Any portion of the files may be matched with respect to time periods, hospitals, etc., in preparation for collating files or parts of files. Any whole or part of one record may be rewritten with any whole or part of another record to produce a longer, or composite, record for each patient. The entire system can be periodically up-dated and new information merged with or substituted for existing information.

Operational Use

Using a combination of the above procedures, special files can be created, giving a comprehensive history of psychiatric transactions and service life changes for any selected patient population. With advanced technology in computer hardware and ingenuity in programmer software, a complete psychiatric record-keeping system has been created for members of the naval service. This inpatient file with post-hospital follow-up provides an unparalleled opportunity for research in an area which demands feedback of outcome information for meaningful evaluations. In a study of psychiatrists' clinical decisions in relation to ratings of their competence by superiors[9], the investigators conducted detailed analyses of psychiatrists' decisions in one psychiatric service and followed up the patients affected by these

decisions within the Inpatient-Change System. It was found that the differences in decision strategies employed by different doctors accounted for significant variance in post-hospital success rates.

An experimental treatment program for personality disorder patients was evaluated in a similar manner using the Inpatient-Change Files[7], and revealed that selection, not experimental treatment, accounted for much of the variation in success rates. Large scale prognostic studies have been conducted utilizing thousands of psychiatric cases from which actuarial tables have been derived to assist the clinician and administrator in making sound decisions[1,2,3]. Only within such a longitudinal framework can base rates be developed and variations in hospitalization rates and treatment outcomes be evaluated. Such hospitalization base rates have been developed for drug abuse, alcoholism, and total psychiatric disorders in the Navy and Marine Corps population by demographic and occupational characteristics and by fiscal year.

Summary

Although the military service represents a unique environment, research on incidence, prognosis, and treatment of psychiatric disorders in the naval service provides insight into reactions under unusual stress, conditions precipitating illness, the efficacy of treatment strategies, and short-term or long-term prognosis for hospitalized psychiatric patients under various institutional and organizational constraints. Consistent findings should serve to broaden our understanding of psychiatric conditions and aid in more effective management. A computer-based information system provides the capability for large-scale, multivariate research which includes the type of feedback needed to improve psychiatric treatment effectiveness.

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Footnote

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Although the military service represents a unique environment, research on incidence, prognosis, and treatment of psychiatric disorders in the naval service provides insight into reactions under unusual stress, conditions precipitating illness, the efficacy of treatment strategies, and short-term or long-term prognosis for hospitalized psychiatric patients under various institutional and organizational constraints. Consistent findings should serve to broaden our understanding of psychiatric conditions and aid in more effective management. A computer-based information system provides the capability for large-scale,

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